

ch 6 Review

methods of Integration

1. Basic Formulas

2. u-substitutions

let $u = ?$ find du
 or inside of composite dx
 or bottom of fraction

use if one
part is the
deriv. of
another part

$$\int f(x) dx \rightarrow \int g(u) du$$

hard

basic

3. parts:

$$\int u dv = uv - \int v du$$

often used on
a product
or $\tan^{-1}x, \ln x$

$$u = \text{LIPT} \quad dv =$$

$$du = \quad v =$$

4. Partial Fractions

$$\int \frac{1}{(x)} dx = \int \frac{A}{()} + \frac{B}{()} dx$$

Solve Differential Equations

find y

$$\frac{dy}{dx} = g(x)$$

$$y = \int g(x) dx \quad \text{RTC baby}$$

$$y = G(x) + C \quad \text{use initial condition to find } C$$

$$\frac{dy}{dx} = g(xy)$$

separation of variables $\int \frac{dy}{h(y)} = \int j(x) dx$

still need to RTC
dudes

Dec 2-8:54 AM

Dec 2-9:42 AM

Law of exponential change

$$\frac{dy}{dt} = k y$$

rate is proportional to amount

$$y = y_0 e^{kt}$$

$k > 0$ growth
 $k < 0$ decay

Newton's Law of cooling

$$T = T_s + (T_0 - T_s) e^{-kt}$$

Logistic Growth

$$\frac{dP}{dt} = k P (M - P)$$

$$\lim_{t \rightarrow \infty} P(t) = M$$



$$P = \frac{M}{1 + A e^{-mkt}}$$

$$A = \frac{M - P_0}{P_0}$$

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Dec 2-9:51 AM